DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 04-30-08 has been entered.

Amendment

2. Acknowledgement is made of Amendment filed 04-30-08.

3. Claim 11 is amended.

4. Claim 20 is canceled.

Response to Arguments

5. Applicant's arguments filed 04-30-08 have been fully considered but they are not persuasive.

Applicant's arguments and responses:

A. Claim 11 has been amended to reflect that the fuse bridge of the present invention is designed to respond to environmental heat, and the fuse of Krueger is designed for current overload protection.

This argument is not persuasive because

1) firstly, the added limitation in amended claim 11, "wherein the fuse bridge is designed to melt if a defective local component overheats so that the electric contact is interrupted across the respective break or gap." is a new issue. Please see the rejection of claim 11 below.

2) Secondly, Krueger mentioned in a few places that the fusible link has "the melting point temperature" [col. 6, line 10, 19 and 36]. "The melting point temperature" means it will melt at that temperature, no matter the heat is come from the current or from ambient.

B. The word "heat" is not present in the entire Krueger patent.

This argument is not persuasive because

Krueger disclosed "the melting point temperature" of the fuse, the melting point of the temperature is depended on the "heat".

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 11-15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krueger et al. (US6043966) in view of Rottenberg et al. (US20030149456).

Re claim 11, Krueger et al. clearly show and disclose

A printed circuit board (15, fig. 1) comprising strip conductors (25, fig. 1) for electronic circuits and connections (a printed circuit board having a plurality of conductive traces deposited on a surface [ABSTRACT]) for a voltage supply unit (an electrical assembly 10 [col. 3, line 34], fig. 1, a voltage supply or power supply is very a common unit, and an electrical assembly inherently could be or could be connected for a voltage supply) being equipped with at least one SMD-component (surface-mounted, electronic components [col. 1, line 32]) and additional parts (additional electrical components [col. 3, line 23]) that are soldered in a suitable manner (fig. 1), said voltage supply unit being connected to at least one supplying strip conductor (conductive layer 135 is deposited on the substrate 87 connecting the first and second circuit traces 125,130 [col. 4, line 32]),

Krueger et al. does not disclose

wherein at least one of the supplying strip conductors includes a break which is bridged in a conductive manner by means of a fuse bridge, said fuse bridge consisting of or comprising a basic material, the melting point of which is lower than the melting point of the material of which the strip conductors are made.

Rottenberg et al. disclose a device wherein

at least one of the supplying strip conductors includes a break (64, fig. 3C) which is bridged in a conductive manner by means of a fuse bridge (51', fig. 3C), said fuse bridge consisting of or comprising a basic material (metal conductor 62,

[0056], fig. 3C), the melting point of which is lower than the melting point of the material of which the strip conductors (metal conductors 60a and 60b [0056]) are made. (the metal conductor 62 fuses to form a bridge to the strip conductors. The metal conductor 62 is formed of a metal having a low melting point. The lower temperature should be much less than the melting point of the strip conductors. [0056])

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fuse bridge of Krueger et al. by using a lower melting point metal conductor as taught by Rottenberg et al., in order to manufacture a lower melting point fuse which provides better protection control.

Krueger et al. further disclose

wherein the fuse bridge is designed to melt (the fusible link has "the melting point temperature" [col. 6, line 10, 19 and 36]) if a defective local component overheats so that the electric contact is interrupted across the respective break or gap. (if the temperature reaches the melt point, the fuse link will be interrupted.)

Re claim 12, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11, wherein the melting point of the basic material is at least as high as the melting point of the solder (the melting point of tin or a tin/lead alloy is higher than the melting point of solder) used for placement of the printed circuit board.

Re claim 13, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11, wherein the fuse bridge fully consists of metallic material (tin or a tin/lead alloy is applied to the thin fusible elements 136 forming fusible links 139 [col.4, line 64]).

Re claim 14, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 13, wherein the metallic material comprises tin or any tin alloy (tin or a tin/lead alloy is applied to the thin fusible elements 136 forming fusible links 139 [col.4, line 64]).

Re claim 15, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11, wherein the fuse bridge is connected to material of the strip conductor in a conductive fashion by means of the solder used in the soldering process (These discrete surfaced-mounted electronic components are typically soldered or electrically connected to the conductive traces [col. 1, line 34]).

Re claim 18, Krueger et al. clearly show and disclose

The printed circuit board as claimed in claim 11, wherein the basic material for manufacturing the fuse bridge is coated with a layer (a second conductive layer is applied to the first conductive layer to form a fusible link [col. 2, line 19]) made of a material out of the group consisting of tin (tin [col.4, line 64]), any tin alloy (tin/lead alloy [col.4, line 64]), gold and passivated copper (electroless plated copper [col. 5, line 23]).

8. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krueger et al. in view of Rottenberg et al. as applied to claim 11 above, and further in view of Montgomery et al. (US6034589).

Re claim 16, Krueger et al. and Rottenberg et al. disclose

The printed circuit board as claimed in claim 11,

Krueger et al. and Rottenberg et al. do not disclose the fuse bridge being shaped in such a way that it can be fed to a conventional pick-and-place machine in a taped and magazined fashion.

Montgomery et al. teaches a device wherein

the fuse bridge is shaped in such a way that it can be fed to a conventional pick-and-place machine (the use of surface mount components generally lowers manufacturing costs by allowing the use of highly automated assembly equipment [col. 1, line 20]) in a taped and magazined fashion (taped and magazined is a well known package in the art of surface mount components and a common fashion for the surface mount components used in the highly automated assembly equipment).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fuse bridge of Krueger et al. and Rottenberg et al. with the same shape as taught by Montgomery et al., in order to “low manufacturing costs by allowing the use of highly automated assembly equipment.” (Montgomery et al., col. 1, line 20)

Re claim 17, Krueger et al. and Rottenberg et al. disclose

The printed circuit board as claimed in claim 11,

Krueger et al. and Rottenberg et al. do not disclose the fuse bridge being manufactured by severing from a wire (fusible elements may comprise wires [col. 5, line 44]) or a sheet-metal strip.

In the same field of wiring board with fuse, Montgomery et al. teaches the following:

wherein the fuse bridge is manufactured by severing from a wire (fusible elements may comprise wires [col. 5, line 44]) or a sheet-metal strip.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the fuse bridge of Krueger et al. and Rottenberg et al. with the wire as taught by Montgomery et al., since Montgomery et al. states in [col. 1, line 25], "in great demands for smaller, higher reliability, less costly fuses with greater amperage and voltage ratings."

9. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krueger et al. in view of Rottenberg et al. as applied to claim 11 above, and further in view of Peter (US6314789).

Re claim 19, Krueger et al. and Rottenberg et al. disclose

The printed circuit board as claimed in claim 11,

Krueger et al. and Rottenberg et al. do not disclose adjacent supplying strip conductors being separated from each other by recesses.

Peter teaches a device wherein

adjacent supplying strip conductors are separated from each other by recesses (cutout 20 [col. 3, line 19], fig. 1)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to separate the strip conductors of Krueger et al. and Rottenberg et al. with the cutout as taught by Peter, since Peter states in [col. 1, line 50], “The heat barrier prevents thermal "cross-talk" between the support elements, so that the first heat source cooperates only with the first sensor element, and the second heat source cooperates only with the second sensor element, i.e., the heat barrier creates a thermal isolation between the two sensor elements and between respective sensor element and the heat source not assigned to that sensor element.”

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US-20030149456 US-20020071297 US-20010050608 US-20010012732

US-6034589 US-5166656 US-6043966 US-6314789 US-5272804

US-6617963 US-5708553 US-6133054 US-4689597 US-4757423

US-6445563 US-5193044 US-4680568 US-4017728 US-7087249

US-6614341 US-6603385 US-6252292 US-6011458 US-5963122

US-5939217 US-5928538 US-5917399 US-5899707 US-5831507

US-5682057 US-5652562 US-5478965 US-5363272 US-5229739

US-5099218 US-5086122 US-4869972 US-4494104 US-4131869

Any inquiry concerning this communication or earlier communications from the examiner should be directed to XIAOLIANG CHEN whose telephone number is (571)272-9079. The examiner can normally be reached on 7:00-5:00 (EST), Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dean Reichard can be reached on 571-272-2800, ext 31. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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